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LEADER COMPLEXITY AND LEADERSHIP STYLE

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Abstract

It was found that Fiedler's esteem for one's least preferred co-worker (LPC) scale was positively correlated with an individual's cognitive complexity. This hypothesis was supported in a variety of ways.

The LPC score was correlated with a measure of cognitive complexity, similar to the scale used by Scott (1967). High LPC subjects also showed more complex cognitions in making judgments about task settings than did low LPC subjects. And finally, high LPC subjects had more complex cognitions in their perceptions of actual behavior and of other co-workers. This information was integrated into Fiedler's theory of leadership effectiveness and a number of new approaches were suggested.

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Introduction

For the last 17 years Fiedler (1955, 1958, 1963) and his associates have been involved in a research program to investigate the relationship between leadership variables, group task situations, and group productivity. The most important variable underlying much of this research has been the leader's "Esteem for his Least Preferred Co-worker," (LPC). To obtain a measure of this variable, the individual rates his LPC on 17 bipolar adjective scales:

pleasant :___:___:___:___:___:___:___:___: unpleasant
8 7 6 5 4 3 2 1

and the sum of these ratings is treated as his LPC score. In general, this score has been viewed as a measure of a leadership effectiveness trait. In recent work Fiedler (1964, 1965) has presented a model for the prediction of group performance based upon the leader's LPC score and upon the favorableness of the group-task situation for the leader. Fiedler (1967) presents a considerable amount of evidence indicating that a leader with a low LPC score (seen as being task-oriented) tends to perform well in situations that are very easy or very difficult and that leaders with a high LPC score (seen as being interpersonal relations-oriented) perform well in situations that are of medium difficulty. The LPC score, however, has not been systematically related to other conceptual and theoretical orientations as measured by behavioral or personality indices (Fiedler, 1967).

The underlying rationale for the present research was based on the assumption that an individual who obtains a high score on the LPC measure must be able to attribute both good and bad attributes to the same stimulus person (i.e., the favorable end of each scale has the higher score). In other words, a high LPC subject (very few Ss are extremely high--all positive ratings) must see his least preferred co-worker as having some good characteristics while the low LPC subject sees this person as having all bad characteristics. This sort of approach suggested that perhaps the LPC score might be related to such concepts as stereotyping, response sets and one's ability to differentiate between various characteristics of a stimulus object.

In an examination of the literature dealing with cognitive complexity measures it was also found that a number of other authors have specifically mentioned Fiedler's LPC scale as a possible measure of the complexity of one's cognitions.

For example, Bieri (1961) said in a review of cognitive complexity: "Another possible method of measuring cognitive complexity is advanced by Fiedler (1958) who analyzed two social perception scores in relation to a group's relative acceptance of the group leader. One component of the Assumed Similarity scores with which they were dealing indicated the diversity of the perceptions of the other." This component was the LPC score and as we have mentioned before, the higher the score the more diverse the ratings. Other similar direct references have been made by Schroder, Driver & Streufert (1967) and Bass, Fiedler & Krueger (1964).

Hypotheses

Based upon the above review, the following hypotheses were generated for more specific examination in a series of empirical studies.

1. The LPC measure should be positively related to other measures of cognitive complexity.

   A large amount of information indicates that this relationship should exist. However, to date, there have been no direct tests of this hypothesis. To do so will, therefore, require the choice of a complexity measure.

2. The LPC score should be positively related to the complexity of the cognitions that an individual has about group task situations.

   If people with different LPC scores do indeed differ in their cognitive complexity levels then we would expect these differences to manifest themselves in the perceptions which they have of group task situations. More specifically, we would expect those who are more complex to be able to differentiate more clearly than those who are cognitively simple between various aspects of group settings and to utilize more information about these settings.

3. The high LPC subjects will have cognitions relevant to the attainment of good interpersonal relations and the low LPC people will have cognitions relevant to task success.

   Fiedler's interpretation of what the LPC score means with regard to why an individual behaves as he does and what behaviors he utilizes to get a job done have not always agreed with the data presented by others. By examining more thoroughly the information and perceptions used by people with high and low LPC scores we should be able to specify in a more explicit manner the ways in which these people differ. For example, this examination will explore the importance of task or interpersonal information about task settings for these two types of people.

Two approaches were taken to test the above hypotheses. First, data already gathered from other studies was examined to see if some of our assumptions were supported. The second approach utilized a set of three new studies to specifically test our hypotheses.

Re-Analysis of Data Already Available

Fishbein, Landy & Hatch (1965) noted that the LPC instrument contains both task-oriented ratings, such as "efficient," and interpersonal-oriented ratings, such as "friendly." Most of the items are, however, of the latter type and the LPC score is thus largely determined by them. A respondent who differentiates between task performance and interpersonal relations is likely to describe his least preferred co-worker as friendly, accepting, warm, etc., while agreeing that he was also inefficient and frustrating. Since the majority of items are interpersonal, the differentiating respondent will obtain a high LPC score. On the other hand, a respondent who does not differentiate between task and interpersonal items will tend to describe the least preferred co-worker not only as inefficient, but also as hostile and unpleasant. His LPC score will be low.

If these assumptions are true, we would expect that the correlation between task and interpersonal items of the LPC instrument will be lower for high LPC respondents than for people with low LPC scores. This hypothesis was tested by the author on 147 student subjects and was supported (Foa, Mitchell & Fiedler, in preparation). The intercorrelation matrix of task, mixed and interpersonal items on the LPC questionnaire for the high LPC subjects was significantly different from the same matrix for low LPC subjects ($p < .05$) and as expected each entry was higher for the low LPC subjects than for the high LPC subjects. The test used here and in the following analysis

Support for these predictions was provided by the results of some other studies. Fiedler (1967) has consistently found that the LPC score correlated quite highly (.80-.90) with the Assumed Similarity between opposites (ASo) score. The ASo score is a measure of the similarity between the descriptions of the least and most preferred co-worker. This high correlation between the two scores indicates, therefore, that the high LPC leader differentiates more between good and bad characteristics of both his least and more preferred co-workers than does the low LPC leader. More specifically, the high LPC leader sees his least and more preferred co-workers as having some good and some bad attributes whereas the low LPC subject sees his LPC in a very negative way and his MPC in a very favorable way.

The hypothesis regarding the use of stereotypes was further supported by the author who asked 119 student subjects to state whether the least and more preferred co-workers they had just described were actual persons. As expected, only 42 per cent of the subjects with a low LPC score rated a real person as their least preferred co-worker, as compared with 83 per cent for the high LPC ($p < .01$). Likewise, high LPC persons also rated significantly fewer stereotypes (19 per cent as against 48 per cent; $p < .025$) as their most preferred co-workers. Individuals with high LPC scores are thus less likely to classify people in terms of stereotypes than are those with low LPC scores.

All of the above results supported our contention that the LPC measure might be related to an individual's cognitions and the complexity of these cognitions. The next step in the research program was to construct studies which were designed explicitly to test our hypotheses. Three such studies are discussed below.

Study No. 1. The relationship between LPC and other existing measures of complexity.

Design. After examining a number of complexity measures suggested by Scott, Kelly, Harvey, Bieri, or Messick we decided to use the type of questionnaire employed by Scott (1963, 1967). Subjects are asked to arrange a list of objects (nations, groups, etc.) into categories which they think belong together and to indicate what they think the objects have in common. For example, from a list of nations, Japan and England might be grouped together as island nations. This procedure is continued until the number of categories of each subject is exhausted. Dimensional complexity is a function of the number of distinctions provided by the category system. The greater the number of different attributes ascribed to the objects the higher the complexity score.

This measure was chosen for two reasons. First, it can be reliably scored. Specifically, absolute complexity equals $H = \log_2 n - \frac{1}{n} \sum n_i \log_2 n_i$, where n is the total number of groups in the list (i.e., AMA, NAACP, bomber crews, etc.) and n_i is the number of groups placed in the same number of categories. Relative complexity equals $R = \frac{H}{\log_2 n}$. H may be treated as an appropriate measure of the dimensional complexity of the cognitive domain and R may be interpreted as the complexity relative to the number of objects to be comprehended.

Second, this measure can be prepared for different cognitive domains. In the past, Scott (1962) has used a list of nations as the domain he wished to study. The present study used a list of 20 groups, and the subjects were asked to make as many categories as possible. Pretests indicated that the distinctions were of the following types: Voluntary-mandatory; competitive-

non-competitive; service-pleasure; elected leader-appointed leader, etc. The scores obtained, therefore, reflect the subject's ability to differentiate among various aspects of group situations and the types of demands that are present. By using a measure directly related to the cognitive domain we wished to examine, we hopefully eliminated the problem pointed out by Vannoy (1965) who suggested that cognitive complexity was domain specific.

Two questionnaires were distributed to 60 University of Illinois students and are discussed below. These questionnaires examined the relationship between the subject's LPC score and the complexity of two of his cognitive domains (a list of groups and a list of nations). Our hypothesis was that the LPC score would be positively related to the group domain (i.e., the ability to differentiate between group characteristics) and perhaps less so to the nation domain. In other words, we wanted to see if the complexity in perceiving co-workers was strongly related to the complexity in perceiving work settings and perhaps less strongly to one's perceptions of nations.

Results

The results indicate that our hypothesis is correct. The correlations between the complexity measures and the LPC are given below.

Males	LPC and Group Domain	$r = .51$	Sign $p < .025$	$N = 17$
Males	LPC and Nation Domain	$r = .28$		$N = 21$
Females	LPC and Group Domain	$r = .15$		$N = 14$
Females	LPC and Nation Domain	$r = .13$		$N = 14$

The number of subjects for each correlation varies because only a very small number of subjects (6) completed both questionnaires in the time available. Half of the subjects received the group domain first and half received the nation domain first.

The subjects were separated by sex because the data indicated that males had had more leadership experience than females. Each subject was asked how many groups he had been the leader of in the past and obtained a score of 1 = no groups; 2 = one to three groups; 3 = many groups. A *t* test indicated that males had significantly more leadership experience than females ($p < .05$). Since Scott (1963) explicitly emphasizes that experience with a cognitive domain is related to the individual's complexity, it was felt that this distinction should be made. It should also be emphasized that most of the work by Fiedler has been done with male subjects.

A second sample of 49 male students produced a correlation of .49 ($p < .025$) between the LPC scale and the Group Domain complexity score, thus replicating our original finding. The next step was to find out how these differences in complexity effect the ways in which these two different types of leaders (high and low LPC) perceive various work situations.

Study No. 2. The relationship between the LPC score and other cognitions.

Introduction. In the first study we found that the LPC score was positively related to an individual's complexity of perceptions about groups. We decided, therefore, that these differences in complexity for high and low LPC subjects should manifest themselves in other ways. More specifically, we hypothesized that:

1. High LPC subjects would be more complex than low LPC subjects in their perceptions of hypothetical task situations. This complexity would be illustrated by using more varied information in making judgments about these situations.

2. High LPC subjects will be more concerned with the information about the interpersonal relations in a task situation than will low LPC subjects.

In other words, for high LPC subjects, responses of favorability about task situations will be positively related to the goodness of the interpersonal relations in the situation.

Design. A questionnaire was written to examine the cognitive differences of individuals with high and low LPC scores. Fifteen hypothetical task situations were presented to 46 University of Illinois students. Each situation contained one of five difficulty levels of interpersonal relations, leader position power and task structure which were explicitly stated in the questionnaire instructions.

Power went from "volunteered and has not been challenged" to "appointed by a higher authority for the duration of the existence of the group." Task structure went from "multiple solutions, routes to the solution unspecified" to "one solution, one route." And interpersonal relations went from "0% like you and each other" to "100% like you and each other." The 15 situations with particular combinations of these three variables were selected at random from the 125 possible combinations (i.e., 5 x 5 x 5). An example is given below.

Situation No. 1

> You have been appointed by a higher authority for the duration of the existence of a given group. This appointment means that you are not responsible to the group or to the authority for your behavior. The group will be working on a creative task which indicates that there are multiple solutions possible and the means of reaching these solutions are not specified. About 50% of the people in the group like you and get along with each other.

Subjects were asked how much influence they felt they would have as leader, how much they like the situation and how favorable it was for themselves as leader, on seven point bipolar scales (very much to very little).

Results. The results from this questionnaire supported a number of our hypotheses. First, it appears that certain cognitive differences exist for high and low LPC leaders in their judgments about hypothetical task situations. For each subject, three regression equations were computed, one for each of the three judgments mentioned above (influence, liking and favorability). These equations are of the following structure:

$$Y = a + b_1 P + b_2 T + b_3 I$$

Influence — Power — Task Structure — Interpersonal Relations

Two differences are clear. Table 1 indicates differences between high ($N = 15$) and low ($N = 16$) LPC subjects for their mean beta weights for the favorability, influence, and liking regression equations. The beta weights that were used in this analysis are relative beta weights which means that each weight indicates the linear relationship between a given cue and the predicted variable relative to the total amount of linearity for that person. The results indicate that high and low LPC subjects weigh interpersonal relations, task structure, and power differently when making judgments about these situations. Two points are of major interest. It is obvious that the interpersonal relations dimension is related to eventual judgments much more strongly than are power or task structure. Three equations times 46 subjects gives 138 correlations between the interpersonal cue and an eventual judgment. Of these 138 coefficients, 127 were significant ($p < .05$). This result supports the earlier work of Fishbein, Landy and Hatch (1967) and Fiedler's ordering of situational favorability (1967). It seems that almost all subjects are more concerned about the interpersonal relations that exist in a given setting than they are about the structure of the task or the amount of power they would have as leader.

TABLE I

Mean beta weights for the three regression equations

		Power	Structure	Interpersonal Relations	
LPC	H	21.8	5.5	75.1	Favorability Equation
	L	3.8	4.3	92.6	
	H	23.5	10.3	68.1	Influence Equation
	L	17.8	5.3	78.6	
	H	15.7	13.3	72.3	Liking Equation
	L	4.4	4.3	92.5	

A further important result is that the interpersonal relations dimension is consistently weighted more by low LPC subjects than by high LPC subjects while high LPC subjects seem to pay more attention to task structure and the leader's position power. No statistical test could be found which tested one set of regression equations against another set. However, this information is interpreted as tentative support for the hypothesis that high LPC people have a more complex cognitive structure because they attempt to utilize information from all three cues rather than from just one cue as does the low LPC subject. The results, on the other hand, are contradictory to the interpretation given by Fiedler (1967) that the high LPC leader is interpersonal relations oriented. We are indeed saying that the low LPC person tends to use the interpersonal relations cue to a greater extent than does the high LPC person in making judgments about hypothetical task situations. This result does not necessarily mean that high LPC people are not motivated to have good interpersonal relations in the group situation or that low LPC people do not prefer good task performance to good interpersonal relations. The findings, however, seem similar to those found by Nealey (unpublished paper) that the low LPC subjects wanted to have good interpersonal relations more than the high LPC subjects when making judgments about hypothetical task situations. We will discuss these contradictions more fully in the final discussion of the paper.

A second analysis lends validity to the above interpretation. Table II shows the mean multiple correlation coefficients for the three judgments. T-tests support the statement that the ratings by low LPC subjects manifest greater linearity than the high LPC subjects for two of the judgments ($p < .05$ for the favorability and liking equations) and the third equation shows similar but non-significant results. These results indicate that the low LPC subjects

TABLE II

Mean Multiple Correlation Coefficients

for the Regression Equations

LPC		
H	L	
74.9	83.1	Favorability Equation*
72.9	77.6	Influence Equation
73.5	85.3	Liking Equation*

* $p < .05$

make more additive and less complex judgments. To make sure that this difference in multiple correlation coefficients could not be explained by the suggestion that high LPC subjects were just more random in their judgments (i.e., there was more error in their judgments) the interactions of the three cues were added to the analysis. More specifically, regression equations were formed using six predictors (power, structure, interpersonal relations, power X structure, power X interpersonal relations, and structure X interpersonal relations) to predict the three judgments. The mean multiple R^s was then compared for the three equations again and it was found that the differences decreased considerably and were no longer significant. In other words, high LPC subjects do utilize the information in a predictable manner. The way they use it, however, is more complex than that of low LPC subjects.

It was felt that a third study was needed in order to validate some of the results of our early work as well as to replicate some of the results of studies one and two.

Study No. 3. The relationship between LPC and complex cognitions.

Introduction. The final study was designed to replicate three earlier findings which were: (1) High LPC people make more discriminations between the various aspects of task situations; (2) all subjects weight interpersonal relations more than other dimensions; (3) low LPC people tend to pay relatively more attention to the interpersonal relations that exist in situations than do high LPC people.

Design. Fifty-nine University of Illinois students were given 16 hypothetical task situations printed on cards. The situations were constructed so that there were four levels of task structure and four levels of interpersonal relations.

Each level of the two variables was matched with each level of the other variable, thereby creating a 4 x 4 design and consequently 16 situations. An example is below: "A certain budgeting group is composed of people who get along very well with each other. Their job is to consider a variety of spending procedures in relation to a number of different possible policy alternatives." (Good interpersonal relations; complex task). Subjects were asked to sort these situations into categories according to how similar they felt them to be. The number of the situations in each category was recorded and the subjects indicated in what way they felt the situations in a given category were similar.

Results. Two classes of data were gathered. First, it was hypothesized that high LPC people would make finer discrimination and, therefore, make more categories. The results were in the right direction but not significant. A t-test on the two means produced a t of 1.11 which has a probability of $.20 < p < .10$. Since the variance of category scores was very limited (i.e., $\hat{\sigma}^2$ of high LPC = .84; $\hat{\sigma}^2$ of low LPC = 1.66), it was felt that perhaps with more situations the results might have been clearer.

The second analysis examined the tendency of the low LPC people to pay more attention to the interpersonal relations in a situation. For each subject the number of distinctions made for each dimension was counted. For example, if a subject could distinguish three levels of interpersonal relations (high, medium and low) and two levels of structure (structured, unstructured), a 3-2 would be recorded for this subject. Two results are worthy of comment.

First, more discriminations are made for the interpersonal relations dimension overall than for the task structure dimension. Thirty-six of the

subjects give more discriminations along the interpersonal relations dimension while only 23 of the subjects make the same number or more discriminations for the task structure dimension ($\chi^2 = 2.88$; $p < .10$). This finding supports our earlier results which indicated that the interpersonal relations dimension seemed to have the strongest relationship with eventual responses about hypothetical task situations.

Second, and most important, is the fact that high LPC subjects tend to make relatively more discriminations in the task structure domain than do the low LPC subjects. A point biserial correlation coefficient was computed between LPC and the dichotomized category variable. More specifically, if the subject had more interpersonal categories than task categories he received a 1. If he had the same number or more task categories than interpersonal categories he was given a 0. This variable was correlated with the LPC score giving a -.35 coefficient ($p < .01$).

So, the high LPC subjects--more than the low LPC subjects--utilize the information about the structure of the task in a given setting when they make certain judgments about the setting. This result supports our earlier work with the regression equations which indicated that the high LPC subjects used the task structure cues relatively more than did low LPC subjects to make judgments about hypothetical task situations.

Summary and Conclusions

In this series of studies we have been attempting to examine the relationship between an individual's esteem for his least preferred co-worker and aspects of his cognitive activity. We have discussed four major findings which have in most cases been replicated in at least one other study. These findings are presented below.

1. The LPC score was positively related to other measures of cognitive complexity.
2. High LPC people differentiated more than low LPC people between task and interpersonal characteristics of both people and situations.
3. High LPC people were more complex in their utilization of information about various task situations.
4. High LPC subjects used the interpersonal relations cue less than low LPC subjects in making judgments about hypothetical task situations.

Perhaps the most important finding of the research was that the LPC score was related to an individual's cognitive complexity in a leadership domain. These results are the first consistent results which have related the LPC score to another area of psychological research. It is also important to note that this relationship was supported in a variety of ways (e.g., examining the LPC scale itself, relating LPC to Scott's complexity measure, analyzing actual observations of task settings, and analyzing judgments about hypothetical task situations). Since much of a leader's activity utilizes his intellectual and cognitive facilities these findings should help us to understand why certain leaders are more effective than others in certain situations.

A possible interpretation for these results in terms of Fiedler's work (1967) would suggest that high LPC subjects perform better in situations of moderate difficulty where some aspects of the situation are good and some are bad. Low LPC subjects, on the other hand, would perform better in settings which were relatively simple (either very favorable or very unfavorable) where differentiating might, in fact, lead to irrelevant behavior on the part of the leader. This theoretical rationale will have to be tested over a variety of task settings to establish its value.

A further finding, which was contradictory to expectations, was that low LPC subjects were more concerned about the interpersonal relations in a task setting than were the high LPC subjects. It was pointed out that this finding had been supported by other data (Nealey, unpublished paper; Steiner, 1959) and that the conceptualization of the low LPC leader as task-oriented and the high LPC leader as interpersonal relations-oriented may need to be re-examined. A possible rationale for these contradictory data suggests that the LPC score may be a reflection of two dimensions of the individual's personality. One of these dimensions would be the leader's cognitive abilities or perceptual tendencies and the other would be related to his needs for achievement or satisfaction from work settings. In non-stressful settings the intellectual or cognitive abilities would dominate the leader's activities. In these situations, therefore, the high LPC leader would pay attention to all aspects of the setting and perhaps use both interpersonally-oriented and task-oriented behaviors. When, however, the situation becomes more stressful the need satisfaction dimension would become more salient and would dominate the leader's activities. It would be in these stressful situations, then, where the high LPC leader would be concerned with the interpersonal relations in a situation (and questionnaire studies can hardly be classified as stressful), and the low LPC leader would be concerned with task success. This interpretation seems to explain some of our results as well as some of Fiedler's results which have indicated that as the stress of the situation increased the task-oriented behavior of the low LPC leaders increased and interpersonally-oriented behaviors of the high LPC leaders increased (Fiedler, Meuwese and Oonk, 1961; Meuwese, 1964). More specific tests of both of the above interpretations will be necessary to understand these data more fully.

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13. ABSTRACT

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The LPC score was correlated with a measure of cognitive complexity similar to the scale used by Scott (1967). High LPC subjects also showed more complex cognitions in making judgments about task settings than did low LPC subjects. And finally, high LPC subjects had more complex cognitions in their perceptions of actual behavior and of other co-workers. This information was integrated into Fiedler's theory of leadership effectiveness and a number of new approaches were suggested.

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